

## Research Article

## Support for infertility treatment in Japan: Differences in perceptions between female clients and staff

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## Abstract

The aim of this study was to clarify the perceptions of both infertile women accessing support services from local governments related to infertility treatment and the public servants providing that assistance. This cross-sectional descriptive study surveyed 62 local government staff members who managed medical expense subsidy programs for infertility treatment in the Hokuriku region of Japan and 84 infertile women attending the clinics. We measured the levels of satisfaction regarding the support services from local governments and the perceptions of the importance of each type of support. The data were analyzed descriptively and included factor analysis and multiple regression analysis. Local governments' support services were analyzed by using four factors: providing information, education and consultation, improving existing services, and improving access. Both the women and the staff endorsed the importance of information provision, the easing of restrictions on subsidies for infertility treatment, reconsideration of the application procedures, and improvement of the publicizing of the available subsidies.

## Key words

client satisfaction, health provider support, infertile women, infertility treatment costs, Japan, survey.

## INTRODUCTION

Japan's declining population causes great concern among its leaders. The inversion of the demographic pyramid points to future difficulties in caring for the rapidly aging population. The increased ratio of the working force to dependents portends economic burden and social strain. A strategy of the Japanese government to address this issue is to provide economic assistance to infertile couples for *in vitro* fertilization (IVF) and micro-insemination. Accordingly, in order to reduce the economic and psychological burden on infertile couples, the Ministry of Health, Labour and Welfare in Japan commenced subsidies for fertility treatment in 2004, administering the program through prefectures, designated cities, and major cities. The staff's role is to manage the medical expense subsidy programs for infertility treatment.

However, the receipt of subsidies addresses only part of the issues faced by infertile couples. Are the subsidies and assistance, in the form of public support services, considered important and satisfying or are the support services another source of stress? Japanese women undergoing IVF and micro-insemination experience a considerable financial

burden and distress (Matsubayashi *et al.*, 2004; Kubo, 2005; Shimamoto, 2007; Niino & Okai, 2008; Tokuchin, 2008). The problem is similar for women in other countries (Collins, 2001; Pratt, 2004; Redshaw *et al.*, 2007; Shahin, 2007).

The services that are provided by local governments can be considered to be a form of material social support. Caplan (1974) defined social support as the material and immaterial support provided by family members, friends, neighbors, and all those surrounding the individual. In this study, the services provided by local governments are defined as tangible social support, and we focused on those services that are provided by local governments as one of the varied forms of assistance that come under the heading of material social support.

However, our literature search yielded no studies in Japanese about the relationship between the assistance offered by local governments and the needs of infertile women. Therefore, we asked: (i) To what extent does the staff's perceptions of women's needs match what women indicate they need?; and (ii) Is the staff's perceptions of women's satisfaction levels similar to what is expressed by women? The establishment of this baseline information can provide the impetus for developing an evaluation of local government assistance. If some discrepancies or inadequacies become apparent, then the addressing of these areas will contribute to the improvement of infertility subsidy programs and the revised support by local governments will better meet the needs of women undergoing fertility treatment.

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## METHODS

### Participants and study protocol

There were 27 designated medical institutions offering medical expense subsidy programs with infertility treatment in the three prefectures of the Hokuriku region of Japan: four in Prefecture A, nine in Prefecture B, and 14 in Prefecture C (as of April 2006). The results of a web homepage search for each medical institution revealed 11 institutions providing a focus on infertility treatment or the results of treatment: two in Prefecture A, four in Prefecture B, and five in Prefecture C; thus, they were invited to participate. Six institutions agreed to participate: one public hospital in Prefecture B and five private infertility clinics (one in Prefecture A, one in Prefecture B, and three in Prefecture C). Also, a convenience sample of 120 women (40 from each prefecture) was invited to participate. The sample constituted 14% of 863 women (from April 2006 to March 2007) using the medical expense subsidy programs with infertility treatment in the three prefectures in the Hokuriku region.

The directors at each institution gave approval for the distribution of between 10 and 40 envelopes (total: 120) to women for the study. During routine consultations, a doctor or midwife explained to each woman the purpose of the study, that participation was voluntary, and that a refusal to participate or withdrawing from the study would not affect any future treatment. Their participation would remain anonymous and the data would be kept confidential. Then, the women were given an envelope containing a written explanation of the study's purpose and the protection of human participants policy, a confirmation form, the questionnaire, and two stamped self-addressed envelopes (one for the confirmation form and one for the questionnaire).

For staff recruitment, the first author (C.T.) contacted the head of each of the 90 offices in the Hokuriku region responsible for implementing the subsidy project, explaining in person or over the telephone the aims of the study and the protection of human participants policy. The first author then asked for the cooperation of the staff member who managed the medical expense subsidy program for infertility treatment. Envelopes, containing the same materials that were given to the women, then were mailed out to the 90 participating offices.

In total, 210 participants were issued questionnaires between 10 September and 10 October 2006: 120 women and 90 staff members. Of these, 85 (71%) women and 64 (71%) staff members returned the questionnaire, for a total of 149 responses (71%). Three questionnaires (one woman, two staff members) were excluded because of missing data. Of the 146 remaining responses (70%), 84 (70%) were from women and 62 (69%) were from staff members.

### Questionnaire

In preparing the questionnaire, we sought information about the various programs. We referred to the Ministry of Health, Labour and Welfare's guidelines regarding the implementation of infertility treatment subsidies (Ministry of Health,

Labour and Welfare, 2007) and the homepages of 94 medical expense subsidy programs for infertility treatment throughout Japan (43 prefectures, 16 designated cities, and 35 core cities, as of April 2006). Our literature review of the assistance or support services offered by prefectural and local governments focused mainly on the areas of maternal nursing and public health nursing. Five midwifery researchers provided content validity of the questionnaire; a pretest with four women undergoing infertility treatment and four staff members established face validity.

We produced a questionnaire with 34 items related to the types of support services: 15 items concerned assistance related to medical expense subsidy programs for infertility treatment and 19 items concerned assistance associated with infertility and infertility treatment. Five items related to the assistance provided by all prefectural and local government programs, 22 items related to the assistance provided by some programs, and seven items related to the types of assistance that our literature search revealed that clients would like to receive, but were not provided by any program, as of April 2006. All 34 items are displayed in Appendix I.

The background variables that were assessed included age, occupation, and parity. We also included the duration of infertility treatment, whether or not the women knew of the subsidy program, and staff members' place of work and occupation.

To determine the level of satisfaction with the support services provided by local governments, we asked all participants the question: "Do you think that the support services provided by local governments to women undergoing infertility treatment satisfy their needs?" They responded by using a three-point Likert scale: "satisfied" (three points), "neither satisfied nor dissatisfied" (two points), or "dissatisfied" (one point). To determine the importance of support services, we asked, "How important do you think the following types of support services are to women undergoing infertility treatment?" for each of the 34 types of support services provided by local governments. This question was scored by using a four-point Likert scale: "extremely important" (four points), "important" (three points), "more-or-less important" (two points), or "not important" (one point).

### Data analysis

First, for the questions relating to the importance of the 34 types of support services provided by local governments, we deleted those that showed a ceiling effect and a floor effect; in other words, restrictions in the range of responses whereby distinctions disappeared and invalidated the responses. For the remaining questions, we performed exploratory factor analysis (principal factor method, promax rotation: hereafter, factor analysis) and deleted those questions yielding a factor loading of  $< 0.4$ . We repeated the factor analysis and chose factors based on an Eigenvalue of  $> 1.0$ . Second, differences between the women and the staff were examined by using an unpaired *t*-test, based on the average score for each factor and the satisfaction rate with assistance by local governments. Third, Pearson's correlations were calculated between each factor and the satisfaction rate of the support services

given by local governments for each woman and staff member. Finally, we carried out separate multiple regression analyses (backward elimination method) for the women and the staff members, with each factor as an independent variable and the satisfaction rate with the types of support services of local governments as a dependent variable. The analyses were carried out by using the statistical package of SPSS, version 14.0 for Windows (SPSS, Chicago, IL, USA), with significance set at  $P < 0.05$ .

### Evaluation of the validity and reliability of the questions

The validity of the structural concept of the questions about public support services was examined by using factor analysis. The internal consistency was obtained by using the overall Cronbach's alpha and the alpha index for each factor.

### Ethical considerations

The Ethics Committee of the Graduate School of Medical Sciences, Kanazawa University, Japan approved the study. All the participants gave informed consent to participate in the study. It was emphasized that declining to participate in this study would not affect the receipt of consultations or treatments at any time thereafter. We provided assurances of the confidentiality of the data.

## RESULTS

### Participants' demographics

The average age of the 84 women was 35 years (standard deviation [SD] = 4.5, range = 26–45 years). Nearly three-quarters (73%) were employed. More than half (58%) had received infertility treatment for > 3 years, the average duration being 43 months (SD = 36.1). Just over three-quarters (76%) were undergoing IVF treatment at the time of the survey and 21% had borne a child in the past. Seventy-nine women (94%) knew that medical expense subsidy programs for infertility treatment were provided by prefectural and local municipal governments.

Of the 62 staff members, 49 (79%) were health-care workers and 13 (21%) were office workers. Of the 49 health-care workers, 46 (94%) were public health nurses. Overall, twenty-two (35%) staff members worked at prefectural public health centers or core city public health centers, 21 (34%) worked at local government health centers, 16 (26%) worked at local government offices, and three (5%) worked at prefectural government offices.

### Factor analysis of the perception of the importance of support services question

Of the 34 items in the questionnaire, nine questions were deleted that showed a ceiling effect. No questions had floor effects. Four questions concerned the assistance related to medical expense subsidy programs for infertility treatment

and five questions regarded the assistance associated with infertility and infertility treatment: insurance coverage for infertility treatment, increased subsidy amounts, protection of privacy when interacting with staff, a friendly and helpful attitude shown by staff, information about infertility centers, introduction to infertility counseling, information about different investigations and treatments for infertility, information about the costs of investigations and treatments for infertility, and the latest information about infertility treatments. We carried out a factor analysis on the remaining 25 items and deleted one more question (reception by health-care workers, not office workers) with a factor loading of < 0.4. We then repeated the factor analysis with the remaining 24 items and selected the four factors that had Eigenvalues of > 1.0 and factor loadings of > 0.4 for all items and, which together, accounted for 56.9% of the variance.

### Validity and reliability

The first factor with eight items (Cronbach's alpha = 0.85), "providing information" (PI), related to information that was useful in infertility treatment and daily life: medical institutions where counseling is available, advice for daily life, treatment results, the treating doctor, infertility itself, the expected and unexpected effects of treatment, adoption and foster parenting, and self-help groups.

The second factor with six items (Cronbach's alpha = 0.85), "education and consultation" (EC), related to assistance provided with the main aim of alleviating clients' worries and concerns: holding consultation meetings in various locations within the prefecture, holding lecture meetings in various locations within the prefecture, holding lecture meetings, the appointment system for individual consultations, holding consultation meetings, and individual consultations when attending in person.

The third factor with five items (Cronbach's alpha = 0.77), "improving existing services" (IES), related to the amelioration of the problems that were experienced by the clients: improvements to pamphlets outlining the subsidies for infertility treatment, improved distribution of pamphlets outlining the subsidies for infertility treatment, elimination of regional differences, expansion of the treatments eligible for subsidies, and allowing applications by mail.

The fourth factor with five items (Cronbach's alpha = 0.82), "improving access" (IA), related to the easing of various qualification restrictions for subsidies: increasing the number of eligible hospitals outside the prefecture over the program specifications, easing the qualifying period of residence, increasing the number of eligible hospitals inside the prefecture over the program specifications, elimination of income limitations, and abolition of the prescribed period for subsidy provision (Table 1). The factors were clearly classified, the Eigenvalue was > 1.0 when a factor was adopted, and the factor names were well reflected by the factor items; therefore, the construct validity was confirmed. The overall Cronbach's alpha was 0.89 and the alpha index for each factor was 0.77–0.85; therefore, internal consistency was confirmed.

**Table 1.** Promax-rotated principal factor loading of the importance of the type of support given by local governments

Factor/question item (overall $\alpha = 0.89$ )	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1 (providing information) ( $\alpha = 0.85$ )				
30. Providing information about medical institutions where counseling is available	0.808†	-0.029	-0.070	-0.017
31. Providing information about advice for daily life	0.792†	0.004	-0.008	0.021
33. Providing information about treatment results	0.764†	-0.189	-0.109	0.096
29. Providing information about the treating doctor	0.749†	0.047	0.128	-0.107
22. Providing information about infertility itself	0.560†	0.068	-0.187	0.225
27. Providing information about the expected and unexpected effects of treatment	0.499†	0.128	0.257	-0.196
34. Providing information about adoption and foster parenting	0.406†	0.321	0.121	-0.181
32. Providing information about self-help groups	0.401†	-0.176	0.108	0.308
Factor 2 (education and consultation) ( $\alpha = 0.85$ )				
19. Holding consultation meetings in various locations within the prefecture	0.159	0.770†	-0.118	-0.031
21. Holding lecture meetings in various locations within the prefecture	-0.170	0.752†	0.090	0.045
20. Holding lecture meetings	-0.186	0.736†	0.063	0.003
17. Appointment system for individual consultations	0.082	0.677†	-0.074	0.084
18. Holding consultation meetings	0.049	0.661†	0.025	0.093
16. Individual consultations when attending in person	0.081	0.484†	0.008	0.122
Factor 3 (improving existing services) ( $\alpha = 0.77$ )				
14. Improvements to pamphlets outlining the subsidies for infertility treatment	-0.033	0.028	0.789†	-0.168
15. Improved distribution of pamphlets outlining the subsidies for infertility treatment	-0.070	0.002	0.778†	0.197
1. Elimination of regional differences	0.121	-0.084	0.526†	0.060
10. Expansion of treatments eligible for subsidies	-0.062	0.069	0.450†	0.028
7. Allowing applications by mail	0.022	0.022	0.426†	0.341
Factor 4 (improving access) ( $\alpha = 0.82$ )				
5. Increasing the number of eligible hospitals outside the prefecture over the program specification	-0.038	0.109	-0.077	0.865†
8. Easing the qualifying period of residence	-0.034	0.116	-0.057	0.656†
4. Increasing the number of eligible hospitals inside the prefecture over the program specification	-0.102	-0.023	0.247	0.644†
6. Elimination of income limitations	0.130	0.096	-0.001	0.603†
9. Abolition of the prescribed period for subsidy provision	0.138	-0.118	0.306	0.426†
Eigenvalue	7.067	2.731	2.291	1.562
Contribution rate (%)	29.400	11.400	9.600	6.500
Cumulative contribution rate (%)	29.400	40.800	50.400	56.900

†Factors with a loading &gt; 0.400.

### Satisfaction rates and perceptions of importance

To the question concerning their satisfaction with local government support services, 34% of the women and staff answered “dissatisfied”, whereas 12% of the women and 14% of the staff answered “satisfied”. Therefore, the satisfaction rates were similar for both groups. The women scored PI, IES, and IA significantly higher than did the staff ( $P < 0.001$ ) (Table 2).

### Correlations between each factor and the satisfaction rate

Table 3 shows the separate Pearson's correlations for each factor and the satisfaction rate with local government assistance for the women and the staff. For the women, the four factors were highly and mutually intercorrelated. A significant negative correlation ( $r = -0.25$ ) was seen between the satisfaction rate and IA. For the staff, a strong positive correlation ( $r = 0.39$ ) was seen between IES and IA. No other significant correlation was found.

### Multiple regression analysis of each factor and the satisfaction rate

A multiple regression analysis of each factor and the satisfaction rate for the women and the staff was carried out. For the women, a significant negative standardized partial regression coefficient ( $P < 0.05$ ) was found for IA in relation to the satisfaction rate with local government assistance. For the staff, a significant negative standardized partial regression coefficient ( $P < 0.05$ ) was found for PI in relation to the satisfaction rate (Table 4).

## DISCUSSION

### Satisfaction rate and perceptions of importance

The results of our survey showed that the satisfaction and dissatisfaction rates were similar for the women and the staff. However, differences were seen between the women and the staff in their perceptions of the importance of each of the four factors.



**Table 2.** Satisfaction rate of the support and recognition of the importance regarding each factor by infertile women and local government staff ( $n = 146$ )

Factor	Women ( $n = 84$ )		Staff ( $n = 62$ )		<i>t</i> -value
	Mean	SD	Mean	SD	
Factor 1 (providing information)	3.33	0.41	2.96	0.57	4.30***
Factor 2 (education and consultation)	2.58	0.56	2.43	0.45	1.74
Factor 3 (improving existing services)	3.47	0.51	2.99	0.46	5.93***
Factor 4 (improving access)	3.45	0.40	2.92	0.62	6.48***
Satisfaction with support	1.77	0.65	1.81	0.67	0.30

\*\*\* $P < 0.001$ . SD, standard deviation.**Table 3.** Pearson's correlations of the importance and satisfaction with the various types of support given by local governments ( $n = 146$ )

Factor	I	Women ( $n = 84$ )				I	Staff ( $n = 62$ )			
		EC	IES	IA	S		EC	IES	IA	S
Providing information (I)	1.00	–	–	–	–	1.00	–	–	–	–
Education and consultation (EC)	0.43**	1.00	–	–	–	0.15	1.00	–	–	–
Improving existing services (IES)	0.48**	0.38**	1.00	–	–	0.22	0.10	1.00	–	–
Improving access (IA)	0.49**	0.50**	0.51**	1.00	–	0.15	0.03	0.39**	1.00	–
Satisfaction (S)	–0.03	–0.21	–0.21	–0.25*	1.00	–0.25	0.07	0.05	0.05*	1.00

\* $P < 0.05$ , \*\* $P < 0.01$ .**Table 4.** Multiple regression analysis of each factor and the satisfaction rate for women and staff ( $n = 146$ )

Factor	Women ( $n = 84$ ) $\beta$	Staff ( $n = 62$ ) $\beta$
Factor 1 (providing information)	0.20	–0.29*
Factor 2 (education and consultation)	–0.13	0.11
Factor 3 (improving existing services)	–0.16	0.08
Factor 4 (improving access)	–0.25*	0.06
$R^2$	0.06*	0.09*

\* $P < 0.05$ .

### Importance of providing information

The women thought that PI was more important, as compared to the staff. Although each Japanese local government produced an Internet homepage that provided information about the medical institutions offering infertility treatment, there were regional differences in the amount of information provided (Takabayashi & Shimada, 2008). Studies conducted in the UK, Canada, USA, and Australia reported the lack of written information about medical treatments (Souter *et al.*, 1998) and about alternative ways of becoming parents (e.g. adoption) (Sabourin *et al.*, 1991; Halman *et al.*, 1993; Schmidt, 1998; Hammerberg *et al.*, 2001; Schmidt *et al.*, 2003). Our study also indicated that local governments could make more effort in providing the information required by infertile women.

### Importance of education and consultation

A main purpose of EC is to address the concerns or worries that accompany being infertile. Studies documented that infertile women experience a great deal of stress and anxiety during infertility treatment (Newton *et al.*, 1999; Matsubayashi *et al.*, 2001; Verhaak *et al.*, 2007; de Klerk *et al.*, 2008; Niino & Okai, 2008) and that they require psychological care (Lechner *et al.*, 2007; Slade *et al.*, 2007; Igarashi *et al.*, 2008; Niino & Okai, 2008). Given the obvious need for emotional support, it was expected that the women and the staff would identify this factor as very important to them. However, we found that the women's average score for EC was 2.58, compared with 3.33–3.47 for the other three factors; the staff members' average score for EC was 2.43, compared with 2.92–2.99 for the other factors. The local government offices were located close to where the women lived. Health-care staff, including public health nurses working at the offices, could respond easily to consultation needs, thereby diminishing the perceived importance. Further development of the concept is needed to include psychological care.

### Importance of existing services and improving access

The women considered IES and IA to be more important than did the staff. These two factors related to their financial burden. Medical expense subsidy programs for infertility treatment place limits on the duration of financial support and on couples' income, so a proportion of the women wanting infertility treatment was unable to access a program. The women emphasized these restrictions. Compared to the rating of the staff, they rated improving access through the

deregulation or relaxation of the qualification criteria for subsidies as more important. Compared to the staff, the women considered the following items as more important: improved content of pamphlets, improved distribution of pamphlets, and allowance of applications by mail. This could reflect their concerns about not knowing or not fully understanding the application system, thus missing the opportunity to apply, and discontent over regional subsidy differences and application inequities (in-person compared to by post). This study indicated that the financial burden on infertile couples was far more serious than the staff realized. Our findings also suggested a need for local governments to consider revising the restrictions on the duration of financial support and on couples' income, as well as the amelioration of the problems in accessing the programs, with public relations measures to improve program awareness and greater efficiency in the application process.

### Correlations between the four factors

Correlations between the four factors that were identified in local governments' assistance yielded interesting results. Strong correlations were seen between all four factors for the women; whereas for the staff, a strong correlation was only seen between the factors related to the medical expense subsidy program for infertility treatment: IES and IA. The women gave equal importance to all the support factors. For those women who recognized the importance of IA, the satisfaction rate with local government assistance was low. These results indicated that the economic burden associated with infertility treatment was a major problem for infertile women; they needed and expected financial assistance from their local government.

### Effect of the four factors on the satisfaction rate

For the women and the staff, the stronger their perception of the importance of IA, the more likely they were to be dissatisfied with local governments' support services. The standardized partial regression coefficients were low; therefore, there was a weak predictive accuracy with the multiple regression analyses. The influence of these low levels of perception on the satisfaction rate was small and could be considered to be only a trend at best.

### Limitations

The respondents were a convenience sample from the Hokuriku region of Japan and the staff worked for regional local governments. Therefore, a generalization of our results to the rest of Japan should be done with caution.

The women in the study cohort with child-bearing experience who then underwent infertility treatment had some differences in perception of their local government public support service, compared to the nulliparous women. Future studies must clarify those two cohorts. Furthermore, the 34 items comprising our questionnaire might not cover all the types of available or possible support services; for instance, some women in the study preferred to access infertility con-

sultations by email and all the women wanted to see a more enlightened approach in order to gain public understanding about infertility treatment.

We measured the levels of satisfaction regarding public support services from local governments by using one question on a three-point scale. Additional questions for the satisfaction scale, a broader response range, and a larger, more representative sample should improve the scale's validity.

### Contribution of the present study and future issues

By investigating the perceptions of publicly supported infertility subsidy programs from the point of view of both government staff and infertile women, we were able to construct a balanced evaluation. This knowledge generation informs policy-makers as to which future issues would benefit from the operation of this program; specifically, information provision, the easing of restrictions on subsidies, public relations measures to improve program awareness, and reconsideration of the application procedures, all of which will lead to better social support to meet women's needs. We provide the baseline data for clarifying the improvement plan for local governments to consider; therefore, the impact of the study's results is quite high for the project's operations and its continuity. Furthermore, not only in local government but also at medical institutions, those nurses who care for women with substantial difficulty in conceiving can use their initiative to publicize infertility subsidy programs and provide information that is useful in infertility treatment and daily life, thus supporting these women more effectively. In 2007, the year after this study was conducted, the Ministry of Health, Labour and Welfare increased the subsidy amounts and eased the income limitations. We need to investigate how such change has influenced the gap between local government staff and women regarding their perceptions of public support. Future studies also need to investigate which types of public support services are needed, who should provide that assistance, when the assistance can be provided most effectively, and how best to provide psychological support.

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### REFERENCES

- Caplan G. *Support Systems in Community Mental Health*. New York: Behavioral Publications, 1974.
- Collins J. Cost-effectiveness of in vitro fertilization. *Semin. Reprod. Med.* 2001; **19**: 279–289.
- Halman LJ, Abbey A, Andrews FM. Why are couples satisfied with infertility treatment? *Fertil. Steril.* 1993; **59**: 1046–1054.
- Hammerberg K, Astbury J, Baker HWG. Women's experience of IVF: a follow-up study. *Hum. Reprod.* 2001; **16**: 374–383.

- Igarashi S, Fujii S, Kimura H, Mizunuma H. Seisyokuiryo wo uketeiru jyosei no huan. *Bosei Eisei* 2008; **49**: 84–90.
- de Klerk C, Hunfeld JAM, Heijnen EMEW *et al.* Low negative affect prior to treatment is associated with a decreased chance of live birth from a first IVF cycle. *Hum. Reprod.* 2008; **23**: 112–116.
- Kubo H. Saikin no ART no seiseki. *Sanfujinka Chiryō* 2005; **91**: 581–588.
- Lechner L, Bolman C, van Dalen A. Definite involuntary childlessness: associations between coping, social support and psychological distress. *Hum. Reprod.* 2007; **22**: 288–294.
- Matsubayashi H, Hosaka T, Izumi S, Suzuki T, Kondo A, Makino T. Increased depression and anxiety in infertile Japanese women resulting from lack of husband's support and feelings of stress. *Gen. Hosp. Psychiatry* 2004; **26**: 398–404.
- Matsubayashi H, Hosaka T, Izumi S, Suzuki T, Makino T. Emotional distress of infertile women in Japan. *Hum. Reprod.* 2001; **16**: 966–969.
- Ministry of Health, Labour and Welfare. *Funin ni Nayamu Fufu Heno Shien ni Tsuite*. 2007. [Cited 16 Sep 2009.] Available from URL: <http://www.mhlw.go.jp/houdou/2007/03/h0327-2.html>.
- Newton CR, Sherrard W, Glavac I. The Fertility Problem Inventory: measuring perceived infertility-related stress. London Health Sciences Centre, Ontario, Canada. *Fertil. Steril.* 1999; **72**: 54–62.
- Niino Y, Okai T. Huninchiryō wo ukeru kanjya nitaisuru shien no arikata nikansuru kenkyū. *Bosei Eisei* 2008; **49**: 138–144.
- Pratt KT. Inconceivable? Deducting the costs of fertility treatment. *Cornell Law Rev.* 2004; **89**: 1121–1200.
- Redshaw M, Hockley C, Davidson LL. A qualitative study of the experience of treatment for infertility among women who successfully became pregnant. *Hum. Reprod.* 2007; **22**: 295–304.
- Sabourin S, Wright J, Duchesne C, Belisle S. Are consumers of modern fertility treatment satisfied? *Fertil. Steril.* 1991; **56**: 1084–1090.
- Schmidt L. Infertile couples assessment of infertility treatment. *Acta Obstet. Gynecol. Scand.* 1998; **77**: 649–653.
- Schmidt L, Holstein BE, Boivin J *et al.* Patients' attitudes to medical and psychosocial aspects of care in fertility clinics: findings from the Copenhagen Multi-centre Psychosocial Infertility (COMPI) Research Programme. *Hum. Reprod.* 2003; **18**: 628–637.
- Shahin AY. The problem of IVF cost in developing countries: has natural cycle IVF a place? *Reprod. Biomed. Online* 2007; **15**: 51–56.
- Shimamoto T. Hunin soudan no genjyō to kadai. *Sanfujinka Chiryō* 2007; **95**: 143–148.
- Slade P, O'Neill C, Simpson AJ, Lashen H. The relationship between perceived stigma, disclosure patterns, support and distress in new attendees at an infertility clinic. *Hum. Reprod.* 2007; **22**: 2309–2317.
- Souter VL, Penney G, Hopton JL, Templeton AA. Patient satisfaction with the management of infertility. *Hum. Reprod.* 1998; **13**: 1831–1836.
- Takabayashi C, Shimada K. Hunin chiryōhi jyōsei ni kansuru jichitai homepage no jyouhou teikyō no arikata. *Nihon Seisyoku Kango Gakkaishi* 2008; **5**: 17–24.
- Tokuchin A. Kuraient no shakaiteikyōkyō nituiteno ichikousatu. *Nihon Seisyoku Kango Gakkaishi* 2008; **5**: 14–16.
- Verhaak CM, Smeenk JM, Evers AW, Kremer JA, Kraaijmaat FW, Braat DD. Women's emotional adjustment to IVF: a systematic review of 25 years of research. *Hum. Reprod. Update* 2007; **13**: 27–36.

## APPENDIX 1

### Questionnaire items about the importance of local government support

How important do you think the following form(s) of assistance are to women undergoing infertility treatment (extremely important/important/more-or-less important/not important)?

Assistance related to medical expense subsidy programs for infertility treatment

1. Elimination of regional differences.§
2. Insurance coverage of fertility treatment.§
3. Increased subsidy amounts.‡
4. Increasing the number of eligible hospitals inside the prefecture over the program specification.†
5. Increasing the number of eligible hospitals outside the prefecture over the program specification.†
6. Elimination of income limitations.‡
7. Allowing applications by mail.‡
8. Easing the qualifying period of residence.‡
9. Abolition of the prescribed period for subsidy provision.‡
10. Expansion of treatments eligible for subsidies.‡
11. Protection of privacy when interacting with staff.†
12. Friendly and helpful attitude shown by staff.†
13. Reception by health-care workers, not office workers.‡
14. Improvements to pamphlets outlining the subsidies for infertility treatment.‡
15. Improved distribution of pamphlets outlining the subsidies for infertility treatment.‡

Assistance related to medical expense subsidy programs for infertility treatment

16. Individual consultations when attending in person.‡
17. Appointment system for individual consultations.‡
18. Holding consultation meetings.‡
19. Holding consultation meetings in various locations within the prefecture.‡
20. Holding lecture meetings.‡
21. Holding lecture meetings in various locations within the prefecture.§
22. Providing information about infertility itself.‡
23. Providing information about infertility centers.†
24. Introduction to infertility counseling.‡
25. Providing information about different investigations and treatments for infertility.‡
26. Providing information about the costs of investigations and treatments for infertility.‡
27. Providing information about expected and unexpected effects of treatment.‡
28. Providing the latest information about infertility treatments.§
29. Providing information about the treating doctor.§
30. Providing information about medical institutions where counseling is available.‡
31. Providing information about advice for daily life.‡
32. Providing information about self-help groups.‡
33. Providing information about treatment results.§
34. Providing information about adoption and foster parenting.§

†Assistance provided by all prefectural and local government programs; ‡assistance associated with infertility and infertility treatment; §the type of assistance that our literature search revealed that clients would like to receive, but that is not provided by any programs (as of April 2006).